

WHAT IS CLAIMED IS:

1. A solid-state imaging device, comprising:  
a photoelectric conversion region including:

5 a plurality of photoelectric conversion portions arranged in rows and columns extending in a vertical direction and a horizontal direction; and

a plurality of vertical charge transfer paths extending substantially in parallel to the columns of the photoelectric conversion portions; and

10 a horizontal charge transfer path for receiving signals from the plurality of vertical charge transfer paths;

wherein the plurality of vertical charge transfer paths is arranged at a horizontal pitch A within the photoelectric conversion region, and at a pitch B that is smaller than the pitch A in a portion where the signals are input into the horizontal charge transfer path.

2. The solid-state imaging device of Claim 1, further comprising a read-out amplifier for receiving signals from the horizontal charge transfer path, wherein the read-out amplifier and the horizontal charge transfer path for receiving signals from the plurality of vertical charge transfer paths are provided for each section into which the photoelectric conversion region is partitioned along the vertical direction.

3. The solid-state imaging device of Claim 2, wherein the read-out amplifier and the horizontal charge transfer path for receiving signals from the plurality of vertical charge transfer paths are provided at a horizontal spacing that is not larger than the width of the section into which the photoelectric conversion region is partitioned.

4. The solid-state imaging device of Claim 2, wherein a plurality of solid-state imaging blocks of substantially the same shape are arranged next to one another in the horizontal direction, each solid-state imaging block comprising:

35 one of the sections into which the photoelectric conversion region has been partitioned;

one horizontal transfer path for receiving signals from this section;

and

one read-out amplifier for receiving signals from this horizontal transfer path.

5 5. The solid-state imaging device of Claim 2, wherein the vertical charge transfer paths are arranged at the horizontal pitch A also where the sections into which the photoelectric conversion region has been partitioned border onto one another.

10 6. The solid-state imaging device of Claim 1, wherein a horizontal width of the vertical charge transfer paths is substantially constant from a portion at the photoelectric conversion region to a portion at the horizontal charge transfer portion.

15 7. The solid-state imaging device of Claim 1, wherein a horizontal width of the vertical charge transfer paths increases gradually or step-wise from a portion at the photoelectric conversion region to a portion at the horizontal charge transfer portion.

20 8. The solid-state imaging device of Claim 1, wherein a plurality of transfer electrodes are arranged above the vertical charge transfer paths and are wired such that, at least in bent portions of the vertical charge transfer paths, transfer driving pulses can be applied independently from other portions of the vertical charge transfer paths.

25 9. The solid-state imaging device of Claim 1, wherein a plurality of transfer electrodes are arranged such that bent portions of the vertical charge transfer paths are positioned below locations between the transfer electrodes.

30 10. The solid-state imaging device of Claim 1, wherein bent portions of the vertical charge transfer paths are positioned below predetermined transfer electrodes; and

35 a transfer path length on which a transfer driving pulse is applied with said predetermined transfer electrodes is shorter than a transfer path length on which the transfer driving pulse is applied with transfer electrodes that are adjacent to said predetermined transfer electrodes.

11. The solid-state imaging device of Claim 1, wherein a conducting line that is electrically connected to a plurality of transfer electrodes with which the transfer driving pulse is applied to the vertical charge transfer paths is provided substantially in parallel to the vertical charge transfer paths at least from a photoelectric conversion region to a region in which the vertical charge transfer paths are arranged with less than the horizontal pitch A.

12. The solid-state imaging device of Claim 1, wherein the largest bending angle in the vertical charge transfer paths is not more than 45°.

13. An imaging system, comprising:  
the solid-state imaging device of Claim 2; and  
a signal processing portion that synthesizes output from the read-out amplifiers of the sections of the solid-state imaging device, and corrects the image at joint portions corresponding to portions where the sections border with one another, so as to display one image.